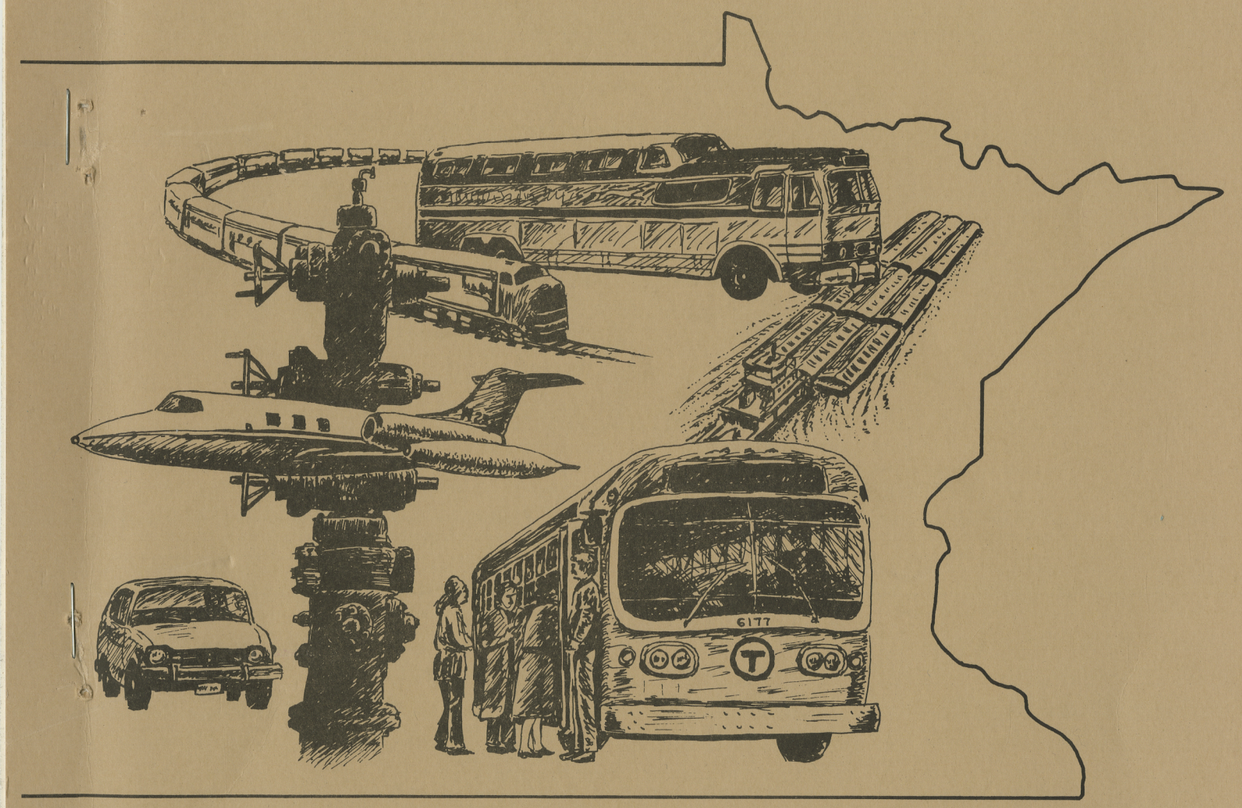
Transportation Analysis



PREPARED BY
THE MINNESOTA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION
PEOPLE AND GOODS MOVEMENT SECTION

SF-00006-02

STATE OF MINNESOTA

Office Memorandum

DEPARTMENT OF TRANSPORTATION
Room 820

TO : Carl J. Hoffstedt
District Transportation
Analysis Engineer

DATE: February 23, 1983

FROM : John Sem
Director
Traffic & Commodity Studies Section

PHONE: 6-1602

SUBJECT: Airport South Study
I-494, TH 77, TH 5
TA-M295

Year 2000 ADT and peak hour traffic volumes for I-494, TH 77, and TH 5 in the vicinity of the proposed "Airport South" development in Bloomington are enclosed. The traffic figures are shown on two sets of schematic drawings. One set shows traffic volumes and turns on the affected roadways with the two "Airport South" traffic assignment zones (867 and 879) included as they were originally forecast by the Metropolitan Council in 1977. The other set of drawings shows the volumes and turns with the trips from TAZ 867 and TAZ 879 omitted.

It has been assumed in making this assignment that an interchange will be built at TH 77 and Killebrew Drive. The turning movement shown schematically at TH 77 and 66th Street is intended to represent all entry and exit movements on TH 77 between CSAH 62 and I-494.

Factors to obtain forecast volumes for years other than the year 2000 are as follows: 1990, .80; 1985, .90; 2005, 1.10; and 2010, 1.20. The second highest continuous eight hour volume can be assumed to be 60% of ADT. The metropolitan area vehicle mix can be assumed to be as follows: Automobile, 81%; light duty truck, 15%; heavy duty truck (gasoline), 2.4%; and heavy duty truck (diesel), 1.6%. Tables showing the percent of 24 hour traffic occurring during each hour for selected routes in the study area are included in the report.

The coded network used for the year 2000 traffic assignment is the Metropolitan Council's "Policy Plan" network 3-E. The year 2000 trip table is based on an assumed seven-county metropolitan area population of approximately 2,470,000, with total employment of 1,350,000. There are about 5,450,000 vehicle trips assigned to the network, with total vehicle miles of travel of over 39,000,000 (up by 75% from 1970). The trip rate per person was assumed to be 3.3, as compared with 2.72 in 1970. The modal split model used to convert person trips to vehicle trips produced a vehicle occupancy rate of 1.59 and 5.4% of total trips by transit. The corresponding 1970 survey figures were 1.5 and 3.0%.

The specific part of the metropolitan area in the vicinity of "Airport South" is characterized by a forecast of substantial growth. From I-35W eastward there are 51 traffic assignment zones near I-494 whose vehicle trip generation accounts for most of the trips on the freeway in the project area. These zones are located between CSAH 62 and the Minnesota River and between I-35W and Delaware Avenue. Included are all or parts of Richfield, Bloomington, the Metropolitan Airport and adjacent U.S. Government land, Mendota and Mendota Heights, and Eagan.

The table below compares total vehicle trip generation for the 51 project area zones for the Travel Behavior Inventory (TBI) survey year of 1970, the 1980 forecast made in 1976, and the year 2000 forecast.

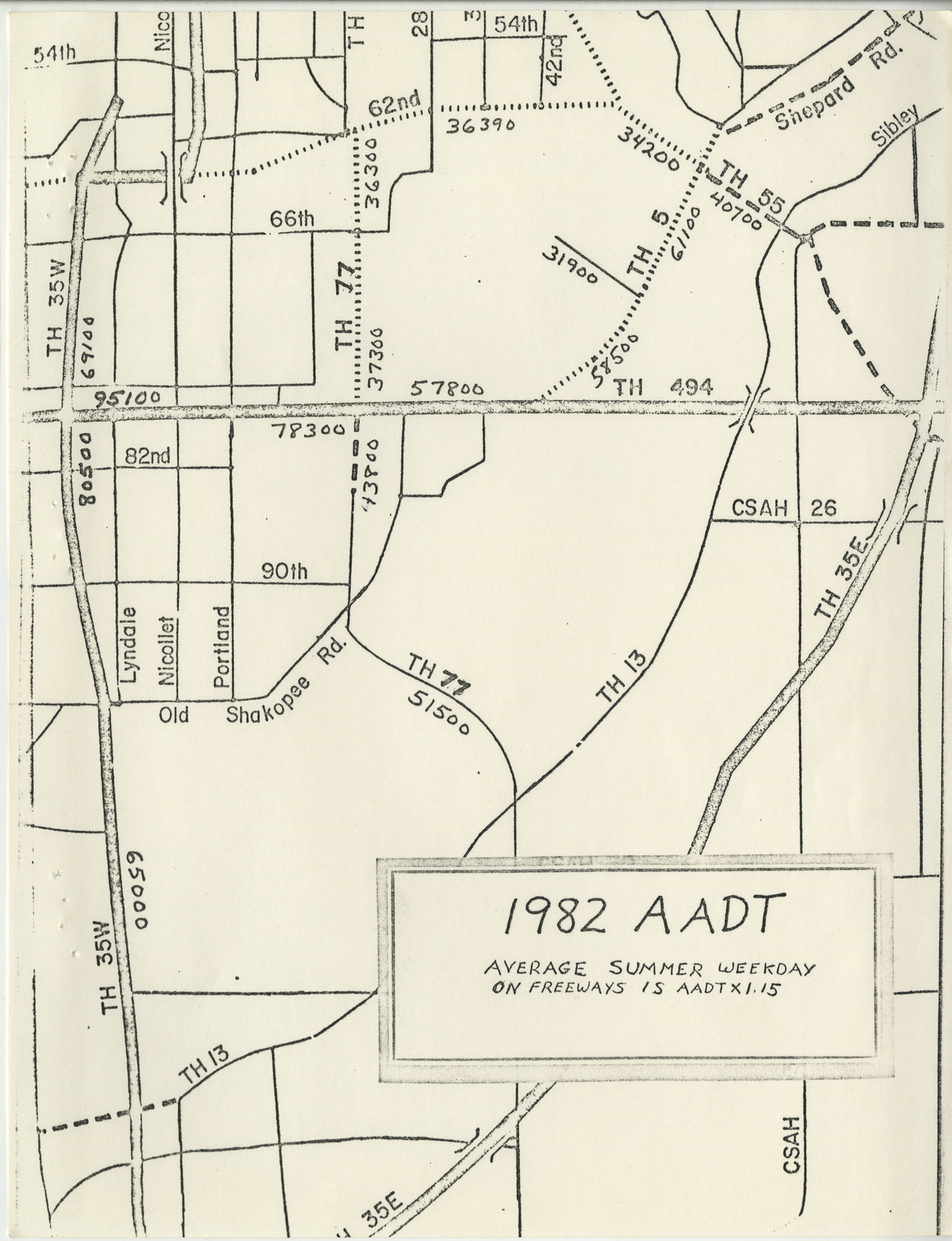
	1970	1980	2000
Richfield	102600	110900	109800
Bloomington	194400	204500	245000
Airport and U.S. Government	54200	57100	104100
Mendota & Mendota Heights	26400	49600	71200
Eagan	27200	121700	189200
	404800	543800	719300

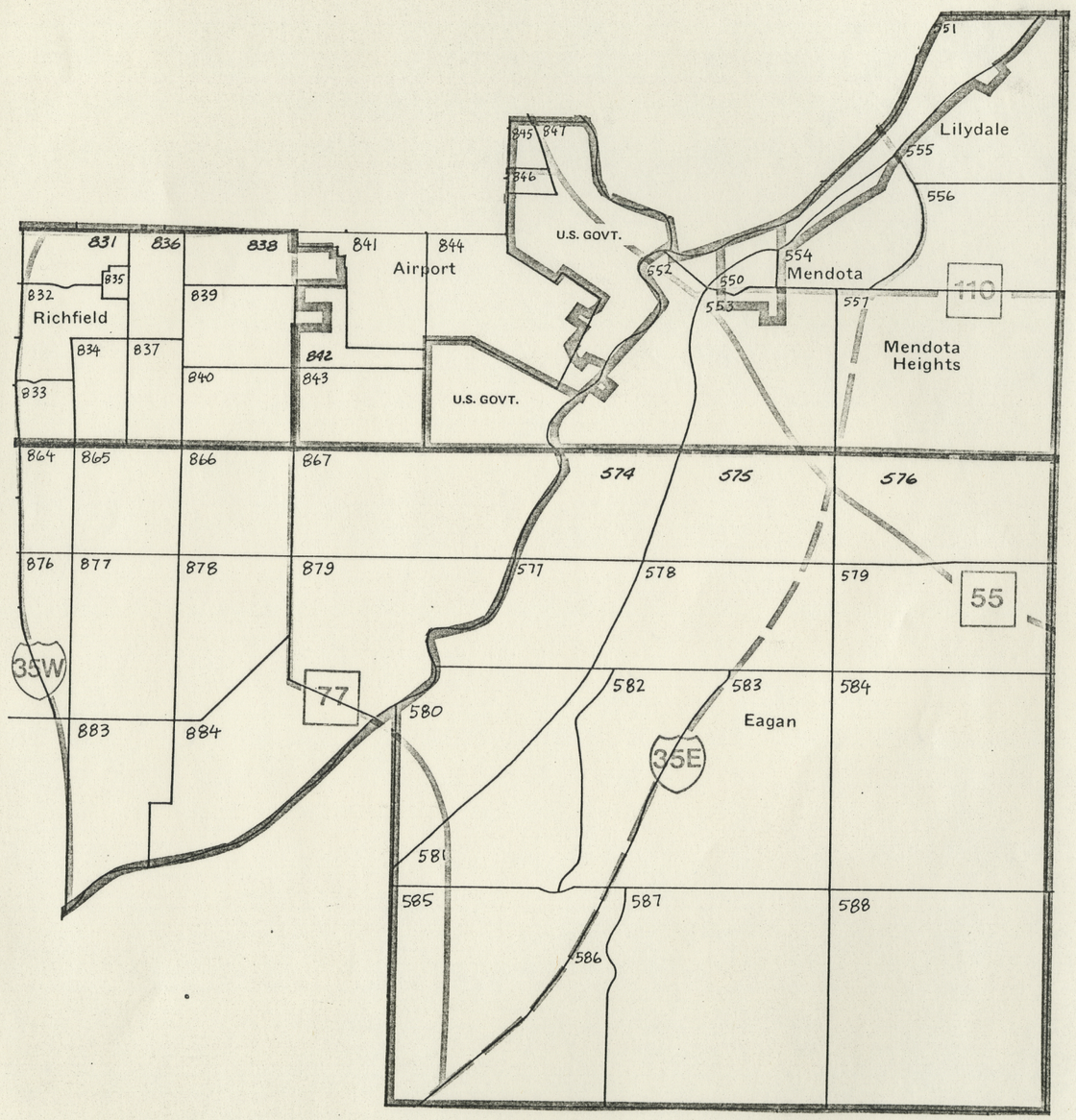
It will be seen from the above table that Eagan and the Airport zones are considered to be major growth areas in the year 2000 forecast. The Bloomington zones included in the entire area between I-35W and the Minnesota River show moderate growth. Some forecast data for the two Airport South zones, 867 and 879, is as follows:

	1970	2000
Population	1043	2711
Employment	8773	17700
Percent vacant land	78%	38%
Vehicle Trip Generation	24061	62863

The year 2000 forecast for the airport zone is based on the Metropolitan Airport Commission's "ultimate development" plan for the airport site. This plan involves the construction of a second terminal facility in the vicinity of CSAH 62 and Cedar Avenue to handle some of the anticipated traffic. The enclosed forecast assumes that about 10000 of the originally assigned 40000 trips in each direction at the present main terminal entrance have been moved to the proposed new facility. This results in a reduction of the computer assigned volume on I-494 at Cedar Avenue of about 4000 trips in each direction.

The peak hour volumes included in this report have been reduced from the original computer assignment of over 6,000 vehicles per hour in the peak period because of capacity limitations on I-494. The factors used to derive future peak hour volumes by trip purpose reflect average conditions found throughout the metropolitan area and probably give a reasonable estimate of travel desires during the peak time period. With only three freeway lanes in each direction available for use, however, it would be necessary for some of the potential peak hour demand to accommodate by adjusting work schedules, finding alternate routes, increasing vehicle occupancy, or adopting different travel modes.





TRIP GENERATION

TAZ	1970 Trip Generation	1980 Trip Generation	2000 Trip Generation
831	12,115	13,721	13,963
832	10,446	7,121	7,223
833	8,261	6,761	6,704
834	12,535	10,042	10,059
835	9,908	10,354	10,881
836	6,551	10,895	11,274
837	8,909	11,316	10,649
838	10,079	10,347	10,304
839	9,719	14,069	13,484
840	14,100	16,298	15,259
841	641	6,024	3,180
842	1,763	1,835	976
843	673	1,695	1,668
844	36,676	32,746	80,170
845	5,928	3,545	3,274
846	177	0	3,136
847	8,354	11,238	11,654
864	16,403	15,645	16,283
865	32,409	29,042	30,432
866	23,032	25,301	27,466
867	20,533	27,080	55,740
876	18,000	12,064	13,770
877	35,181	33,386	38,371
878	11,896	16,379	16,919
879	3,005	7,042	4,643
882	16,640	15,558	17,714
883	13,531	14,020	14,546
884	3,809	8,946	10,153
550	2,202	6,499	4,003
551	2,083	2,377	7,730
552	423	10	507
553	5,682	6,708	12,003
554	1,349	9,706	13,716
555	4,396	11,132	14,505
556	2,690	3,530	5,422
557	7,593	9,630	13,352
574	2	0	298
575	3,540	13,235	16,145
576	4,435	15,697	31,312
577	406	4,631	5,069
578	954	22,233	29,384
579	2,837	3,330	5,993

TAZ	1970 Trip Generation	1980 Trip Generation	2000 Trip Generation
580	1,095	3,015	3,924
581	7,494	21,140	32,012
582	497	3,945	6,643
583	563	3,513	6,209
584	946	6,308	11,158
585	2,487	14,070	22,152
586	1,346	2,547	5,063
587	0	4,459	8,116
588	590	3,591	5,720
Total	404,839	543,776	719,331

EMPLOYMENT

TAZ	1970 Employment	1980 Employment	2000 Employment
831	1062	1127	1300
832	592	629	800
833	619	639	700
834	879	908	1000
835	999	1032	1100
836	683	706	800
837	391	407	450
838	616	700	900
839	473	492	500
840	937	975	1000
841	850	873	1000
842	102	105	200
843	1035	1063	1300
844	8165	10441	14000
845	1670	1715	2000
846	0	0	1500
847	3066	5203	7000
864	2347	2983	3100
865	2990	3775	4000
866	2001	2615	3000
867	8090	10968	17600
876	1304	1632	2000
877	5523	6951	8000
878	473	599	600
879	80	951	100
882	2158	2614	3000
883	625	820	1000
884	173	706	1000
550	282	709	550
551	80	197	850
552	0	0	100
553	350	1125	2000
554	409	1078	1700
555	366	919	1500
556	48	237	400
557	269	935	1300
574	0	0	50
575	586	2144	3700
576	859	3117	5000
577	308	1092	1400
578	1209	4291	5300
579	15	198	350
580	134	542	800

TAZ	1970 Employment	1980 Employment	2000 Employment
581	372	1368	1700
582	15	163	200
583	40	331	600
584	186	991	1500
585	199	871	1200
586	5	139	300
587	9	207	400
588	39	346	500

HOUSING

TAZ	1970 Housing	1980 Housing	2000 Housing
831	983	1000	1000
832	602	615	600
833	538	544	550
834	1072	1084	1100
835	0	0	0
836	914	925	1000
837	1077	1091	1100
838	989	1011	1000
839	1731	1753	1800
840	1990	2018	2000
841	0	0	0
842	105	100	50
843	0	0	0
844	0	0	0
845	0	0	0
846	0	0	80
847	0	0	0
864	714	804	800
865	1230	1376	1400
866	2170	2361	2400
867	174	260	400
876	504	562	600
877	2007	2247	2300
878	2003	2163	2200
879	501	626	800
882	1019	1203	1500
883	1427	1597	1600
884	785	1104	1200
550	199	342	100
551	143	249	600
552	0	0	0
553	124	271	400
554	137	264	350
555	698	1196	1200
556	182	347	500
557	384	731	1000
574	0	0	20
575	163	438	840
576	147	427	900
577	0	0	40
578	186	1186	2200
579	96	314	800
580	20	77	200

TAZ	1970 Housing	1980 Housing	2000 Housing
581	1017	2539	4600
582	81	456	1000
583	71	253	700
584	36	228	900
585	520	1365	2700
586	90	270	700
587	90	540	1200
588	90	307	700

POPULATION

TAZ	1970 Population	1980 Population	2000 Population
831	2537	2454	2048
832	2221	2015	1634
833	1858	1710	1435
834	2945	2892	2480
835	0	0	0
836	3063	2776	2503
837	3927	3565	2925
838	3395	3144	2593
839	5820	5515	4694
840	6781	6448	5373
841	0	0	0
842	362	277	125
843	843	0	0
844	0	0	0
845	262	123	150
846	0	0	200
847	0	50	50
864	2354	2447	2060
865	4488	4556	3853
866	6643	6808	5933
867	501	682	848
876	1905	1933	1706
877	6644	6573	5698
878	7836	7668	6372
879	1547	1772	1863
882	3537	3911	3983
883	5158	5130	4278
884	3104	3431	3089
550	646	1036	287
551	429	716	1661
552	16	0	49
553	512	867	1102
554	543	870	1042
555	2600	3798	3554
556	800	1155	1531
557	1607	2458	2974
574	0	0	47
575	732	1559	2338
576	570	1440	2396
577	0	0	96
578	713	3943	5888
579	377	1083	2101
580	71	261	519
581	3810	8670	12596
582	306	1541	2665

TAZ	1970 Population	1980 Population	2000 Population
583	303	876	1808
584	109	744	2245
585	2313	5007	7491
586	364	924	1803
587	365	1807	3126
588	365	1045	1881

TABLE ____ - T.H. 55 HOURLY TRAFFIC BREAKDOWN
OVER MENDOTA BRIDGE

Hour	2-WAY HRLY %	EB	WB.		
12-1 am	1.0	59	41		
1-2	0.6	56	44		
2-3	0.4	52	48		
3-4	0.4	44	56		
4-5	0.5	46	54		
5-6	1.3	38	62		
6-7	5.5	38	62		
7-8	8.5	40	60		
8-9	6.7	46	54		
9-10	5.5	48	52		
10-11	5.4	48	52		
11-12	5.8	45	55		
12-1 pm	5.6	47	53		
1-2	5.8	50	50		
2-3	6.4	48	52		
3-4	6.2	41	59		
4-5	7.5	47	53		
5-6	6.8	48	52		
6-7	5.4	50	50		
7-8	3.7	50	50		
8-9	2.8	53	47		
9-10	2.7	57	43		
10-11	2.6	56	44		
11-12	2.0	60	40		

TABLE ____ - T.H. 55 HOURLY TRAFFIC BREAKDOWN
WEST OF POST ROAD
(AUG 1982)

Hour	2-WAY HRLY %	E.B.	W.B.		
12-1 am	1.2 %	41	59		
1-2	0.6	47	53		
2-3	0.3	54	46		
3-4	0.3	54	46		
4-5	0.6	53	47		
5-6	1.1	58	42		
6-7	4.7	58	42		
7-8	8.4	53	47		
8-9	6.5	49	51		
9-10	4.8	50	50		
10-11	5.0	50	50		
11-12	5.8	51	49		
12-1 pm	5.2	48	52		
1-2	5.5	50	50		
2-3	5.9	49	51		
3-4	7.7	48	52		
4-5	9.1	49	51		
5-6	8.2	50	50		
6-7	5.1	47	53		
7-8	3.9	51	49		
8-9	3.2	49	51		
9-10	2.7	50	50		
10-11	2.3	49	51		
11-12	2.5	37	63		

TABLE ____ - T.H. ____ HOURLY TRAFFIC BREAKDOWN

ADT = 69,824
EB 35348 WB 34476

TH5 WEST OF TH55

Hour	HRLY % OF ADT	EB	WB		
12-1 am	1.2	60	40		
1-2	0.6	59	41		
2-3	0.4	59	41		
3-4	0.3	59	41		
4-5	0.4	47	53		
5-6	1.1	40	60		
6-7	5.0	36	64		
7-8	8.9	49	51		
8-9	6.3	45	55		
9-10	4.8	50	50		
10-11	4.8	49	51		
11-12	5.4	53	47		
12-1 pm	5.4	51	49		
1-2	5.4	49	51		
2-3	6.1	48	52		
3-4	8.1	52	48		
4-5	9.1	49	51		
5-6	7.9	54	46		
6-7	4.9	53	47		
7-8	3.7	55	45		
8-9	2.8	55	45		
9-10	2.9	58	42		
10-11	2.8	59	41		
11-12	2.0	66	34		

TABLE ____ - T.H. ____ HOURLY TRAFFIC BREAKDOWN

ADT = 82771 Jun 1980 I 494 EAST OF TH 77 (CEDAR AV.)
EB 40021 WB 42750

Hour	Hourly % Of ADT	Hourly Directional Distribution EB	WB	Hourly HCADT % of Hourly ADT	HCADT Split Single Unit - Semi's
12-1 am	1.1	44	56		
1-2	0.7	49	51		
2-3	0.4	48	52		
3-4	0.3	47	53		
4-5	0.3	62	38		
5-6	1.0	61	39		
6-7	4.3	58	42		
7-8	8.2	59	41		
8-9	6.4	58	42		
9-10	4.5	51	49		
10-11	4.5	49	51		
11-12	5.4	43	57		
12-1 pm	5.3	50	50		
1-2	5.2	52	48		
2-3	5.5	48	52		
3-4	7.1	46	54		
4-5	8.8	41	59		
5-6	8.2	42	58		
6-7	5.6	48	52		
7-8	4.5	51	49		
8-9	3.3	46	54		
9-10	3.3	46	54		
10-11	3.6	37	63		
11-12	2.4	37	63		

High Day of Week Factor = _____

High Month of year Factor = _____

TABLE ____ - T.H. 77 HOURLY TRAFFIC BREAKDOWN
NORTH OF I 494

Hour	2-WAY HRLY %	SB	NB		
12-1 am	1.1	51	49		
1-2	0.9	41	59		
2-3	0.3	55	45		
3-4	0.2	52	48		
4-5	0.3	49	51		
5-6	1.0	49	51		
6-7	4.8	44	56		
7-8	8.9	43	57		
8-9	6.4	51	49		
9-10	4.1	51	49		
10-11	3.9	49	51		
11-12	4.8	50	50		
12-1 pm	4.7	52	48		
1-2	4.6	53	47		
2-3	5.2	54	46		
3-4	7.3	53	47		
4-5	9.4	55	45		
5-6	8.6	54	46		
6-7	5.6	53	47		
7-8	4.5	52	48		
8-9	3.8	54	46		
9-10	3.9	57	43		
10-11	3.4	60	40		
11-12	2.0	56	44		

TABLE ___ - T.H. 77 HOURLY TRAFFIC BREAKDOWN
SOUTH OF I 494

Hour	2-WAY HRLY %	NB	SB		
12-1 am	1.2%	40	60		
1-2	1.1	54	46		
2-3	0.3	46	54		
3-4	0.2	49	51		
4-5	0.3	73	27		
5-6	1.1	79	21		
6-7	5.4	79	21		
7-8	9.5	77	23		
8-9	6.2	68	32		
9-10	3.4	59	41		
10-11	3.8	57	43		
11-12	4.3	53	47		
12-1 pm	4.3	52	48		
1-2	4.5	52	48		
2-3	5.1	47	53		
3-4	6.9	41	59		
4-5	9.4	35	65		
5-6	9.2	32	68		
6-7	5.8	41	59		
7-8	4.5	45	55		
8-9	3.6	41	59		
9-10	3.9	41	59		
10-11	3.4	43	57		
11-12	2.0	37	63		

TABLE ___ - T.H. ___ HOURLY TRAFFIC BREAKDOWN

ADT = 49,700 . CSAH 62 WEST OF 77/35
EB 15,699 WB 14001

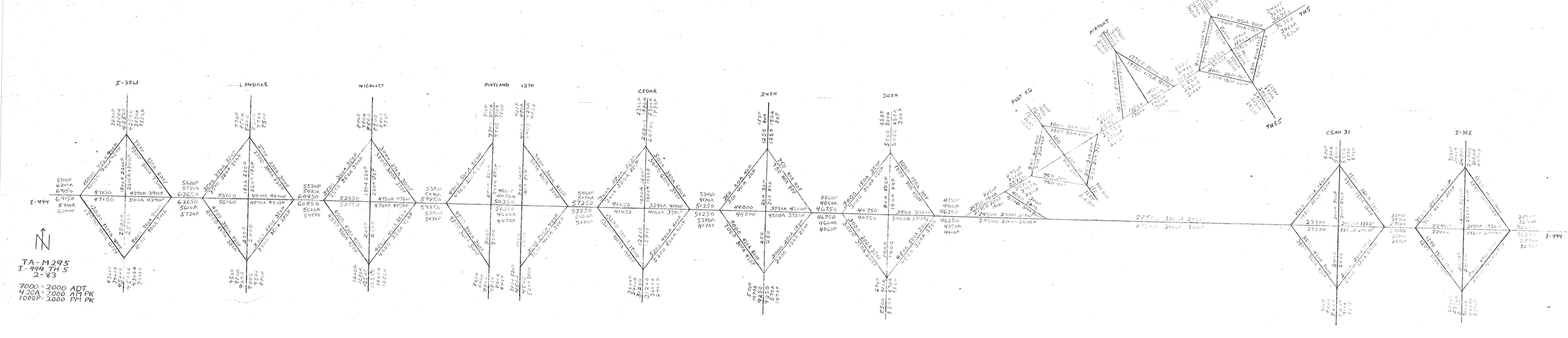
Hour	hrly % of ADT	EB	WB		
12-1 am	1.1	40	60		
1-2	0.6	45	55		
2-3	0.3	51	49		
3-4	0.2	49	51		
4-5	0.3	68	32		
5-6	1.1	66	34		
6-7	5.2	70	30		
7-8	7.2	60	40		
8-9	6.4	58	42		
9-10	5.1	57	43		
10-11	4.9	55	45		
11-12	5.4	52	48		
12-1 pm	5.4	51	49		
1-2	5.4	59	41		
2-3	6.3	55	45		
3-4	7.5	48	52		
4-5	8.4	46	54		
5-6	7.1	47	53		
6-7	5.7	48	52		
7-8	4.6	49	51		
8-9	3.3	47	53		
9-10	3.3	51	49		
10-11	2.8	48	52		
11-12	1.9	48	52		

TABLE ____ - T.H. ____ HOURLY TRAFFIC BREAKDOWN

ADT = 8109
@SAH 1
EAST OF TH 77
Only 6% of ADT

ADT = 12835
CSAH 1
WEST OF TH 77
Only 6% of ADT

Hour				
12-1 am	0.8		1.0	
1-2	0.4		0.5	
2-3	0.1		0.3	
3-4	0.1		0.2	
4-5	0.2		0.3	
5-6	1.1		0.9	
6-7	5.7		4.9	
7-8	12.9		10.2	
8-9	8.2		6.0	
9-10	3.3		3.6	
10-11	2.8		3.6	
11-12	4.8		4.7	
12-1 pm	5.4		5.0	
1-2	3.8		4.5	
2-3	4.2		4.6	
3-4	8.0		7.3	
4-5	11.6		9.8	
5-6	10.4		9.7	
6-7	4.6		6.4	
7-8	3.2		4.8	
8-9	2.4		3.9	
9-10	2.1		3.5	
10-11	1.9		2.7	
11-12	2.0		1.8	


I-35W
LYNDALE
NICOLLET
PORTLAND
12TH
CEDAR
24TH
34TH
POST RD
AIRPORT
CSAH 31
I-35E
I-494
TH 5
TH 55
N
TA-M295
I-494 TH 5
2-83
7000 = 2000 ADT
420A = 2000 AM PK
1000P = 2000 PM PK

TH 77

TH 13

CSAH 1

I-494

KILLEBREW DR

66TH

CSAH 62

TH 77

TA-M295
TH 77
2-83

5000 = 2000 ADT
380A = 2000 AM PK
670P = 2000 PM PK

TA-M295
I-494, TH 5
2-'83
w/o AIRPORT SO. ZONES
7000 = 2000 ADT
420A = 2000 AM PK
1000P = 2000 PM PK

TA-M295
TH 77
2-83
% AIRPORT SO. ZONES
5000 = 2000 ADT
3804 = 2000 AM PK
670P = 2000 PM PK

TH 77

CSAH 1

TH 13

I-494

MILLE BREWS DR

66TH